Presentation to

Warren Town Council

Warren Town Beach

Sanitary Investigation Results

May 22, 2008

FUSS & O'NEILL
Disciplines to Deliver

Presentation Overview

- Review of previous work and current goals.
- Sanitary sewer investigation methods & results.
- Conclusions and recommended next steps.

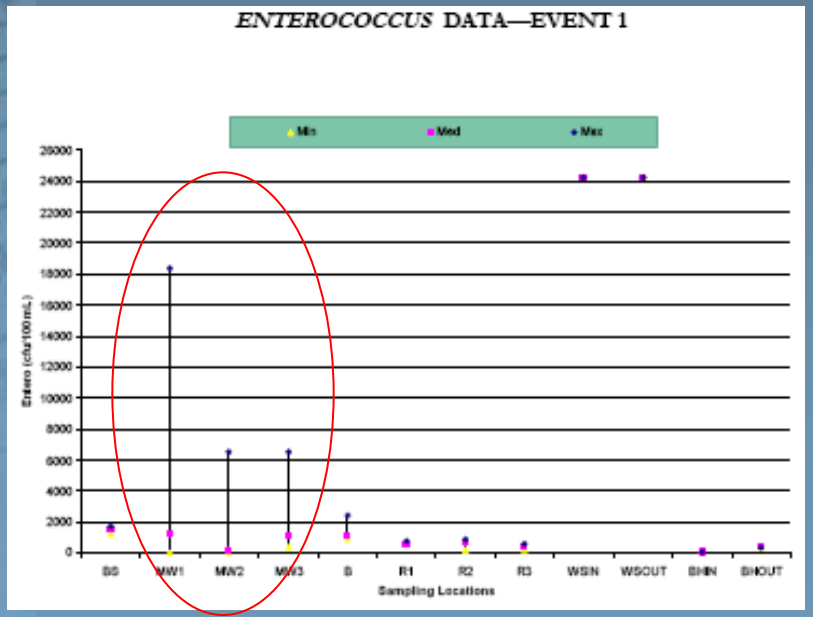
Review of Previous Work & Goals of Current Study

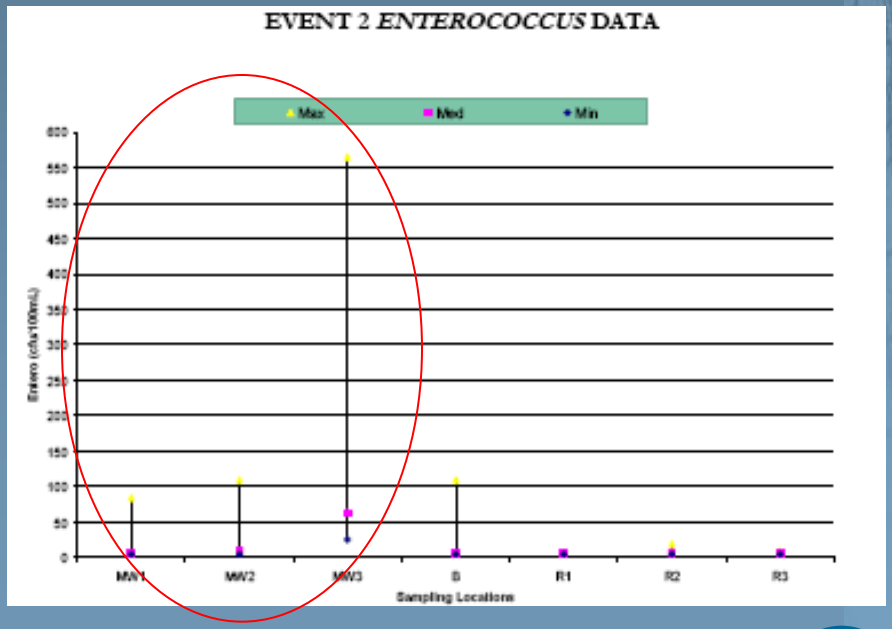
Background

- Bacteria problems.
- Unknown sources.
- Previous interventions (e.g., lining the pipe) have been less effective than hoped.

During our Previous Study We Found

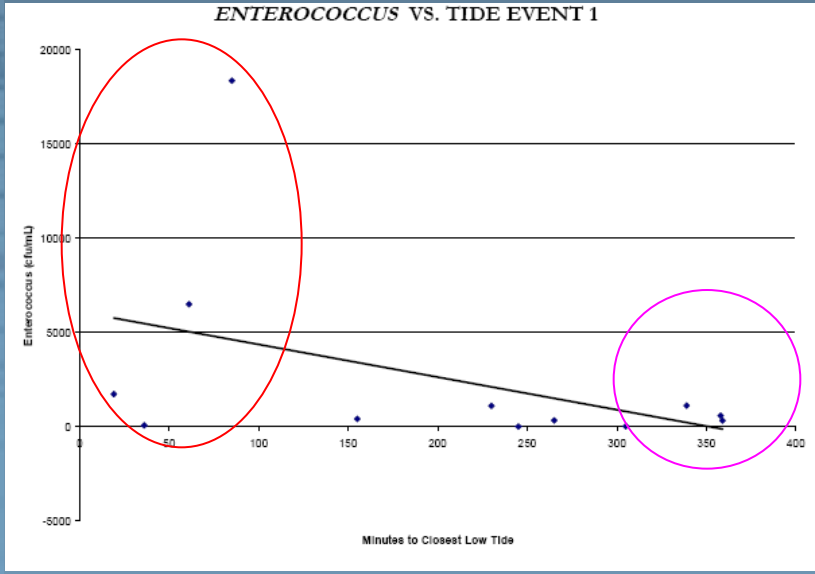
- Problem is wet-weather related, but not always.
- Unusually high levels of bacteria and signature sanitary contaminants in groundwater.

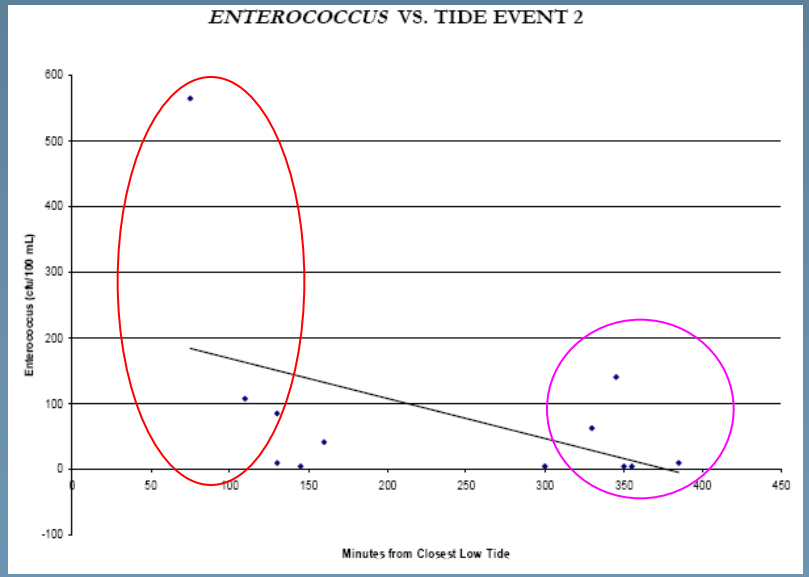




During our Previous Study We Found

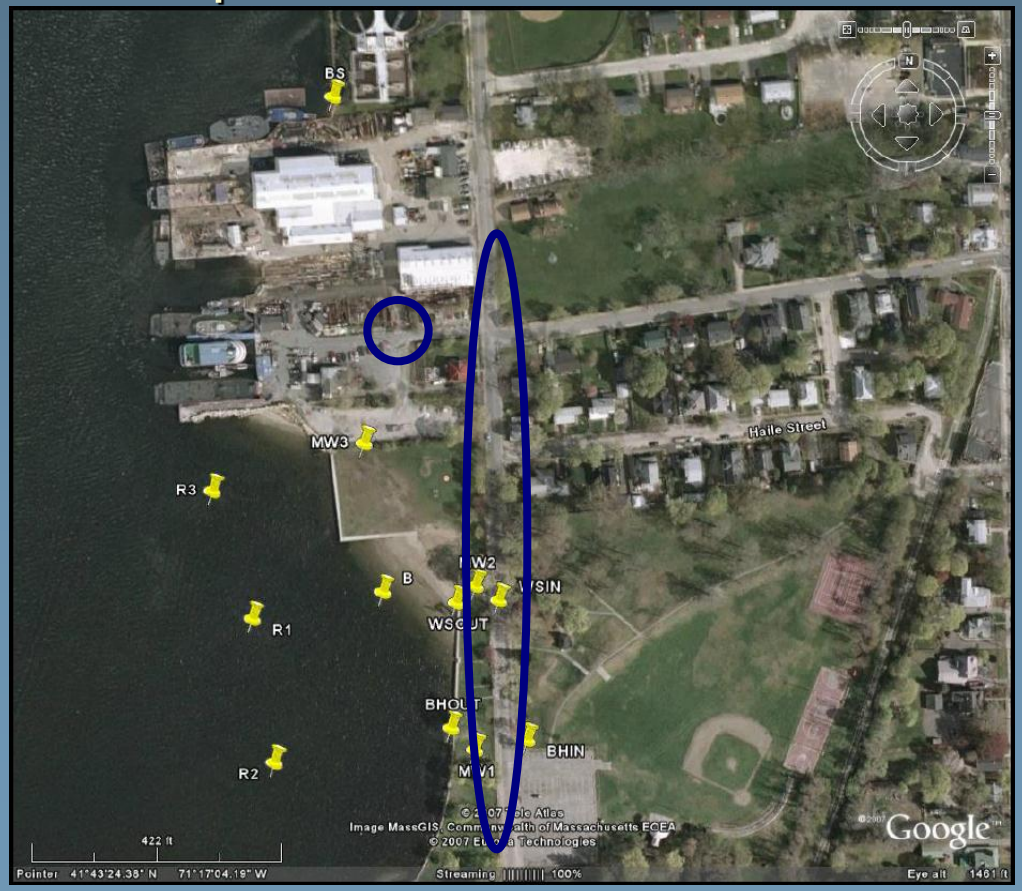
- Groundwater gradient at low tide draws subsurface contamination to the beach.





During our Previous Study We Found

- Potential subsurface sources—Water St sewers and Blount Pumpout Tank.



During our Previous Study We Found

- Dye-testing shows contaminants tend to persist in the beach area.
- Based on dye-testing results, primary sources of impact are likely to be close to the beach.

RHODAMINE DYE CONCENTRATION OBSERVED AT BEACH AND RIVER LOCATIONS

Time Since Dye Injection	Beach (Dye in ppb)	R1 (Dye in ppb)	R2 (Dye in ppb)	R3 (Dye in ppb)
Hour 1	7.30	5.10	5.06	3.12
Hour 6	8.00	7.89	7.77	3.44
Hour 18	6.00	4.78	3.55	3.14
Hour 24	3.63	2.12	0.75	4.73
Hour 30	3.85	2.21	0.15	4.81

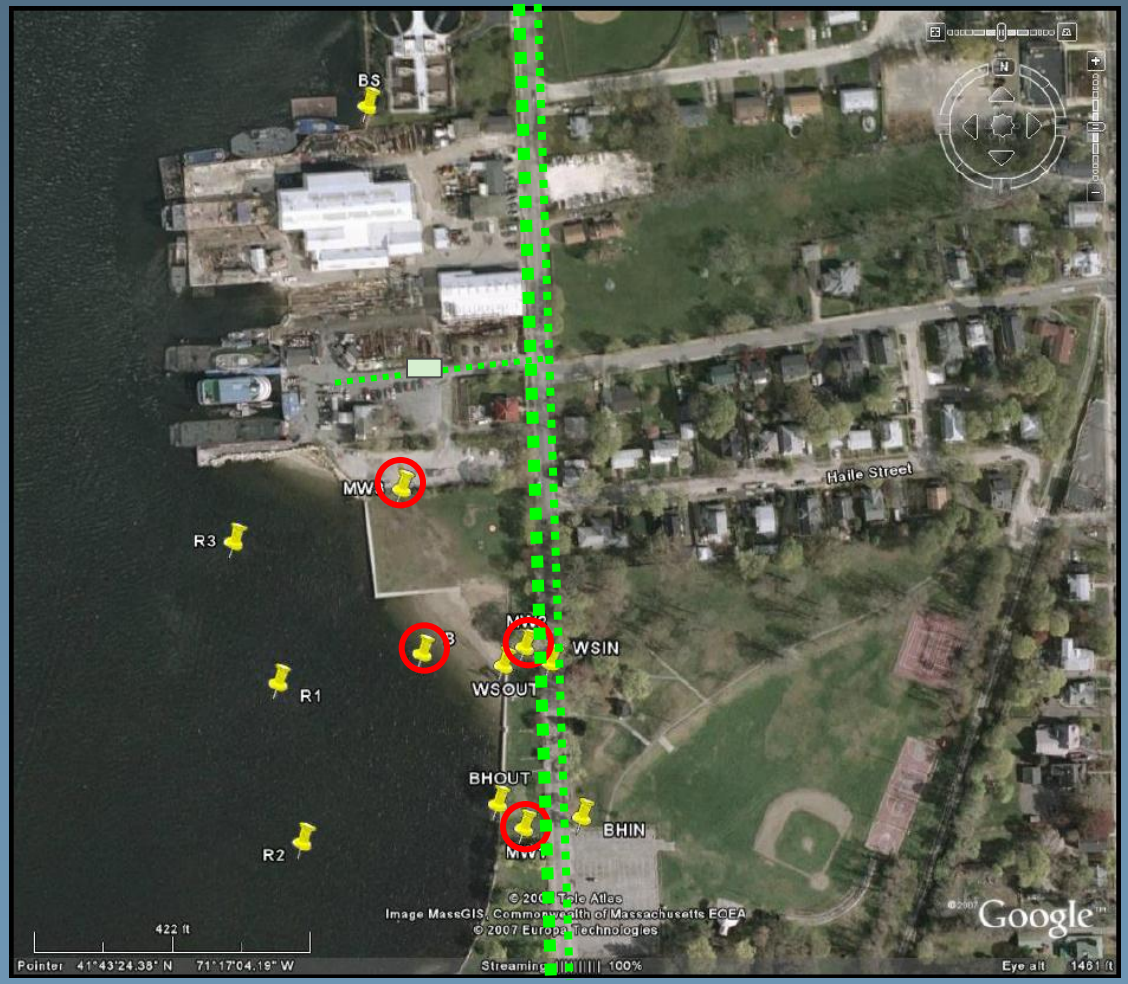
Sanitary Sewer Investigation Methods & Results

Sanitary Sewer Investigation

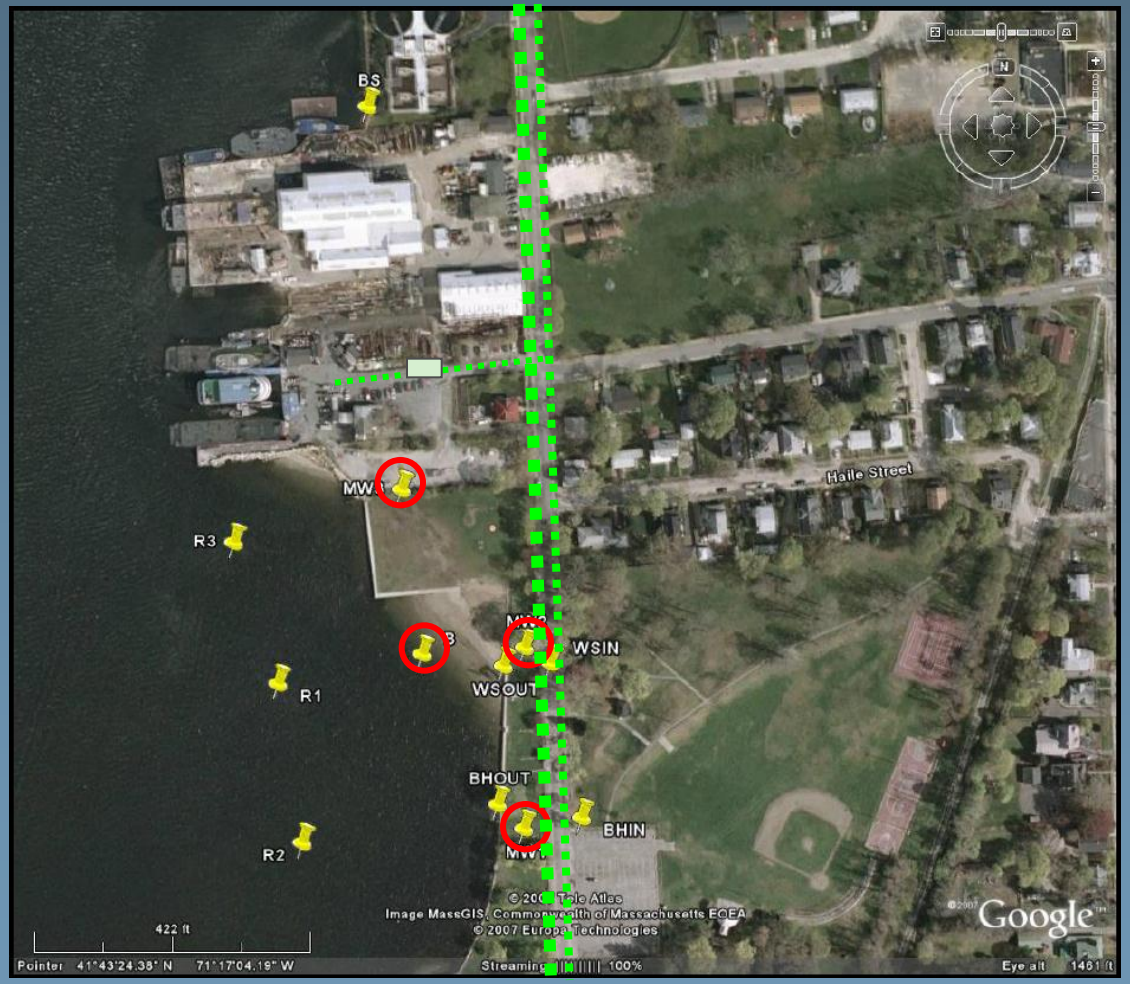
Pinpoint source of groundwater contamination:

- Blount Tank
  - *TV Examination*
  - *leak test*
  - *dye test*
- Water St sewers (12-inch, 24-inch)
  - *dye tests*
  - *Informal leak test*

Study Area & Monitoring Locations



12” Line Dye-Test Results



12” Line Dye-Test Results

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~1700 feet

Partially Lined ~900 feet

Investigation at Blount Boats

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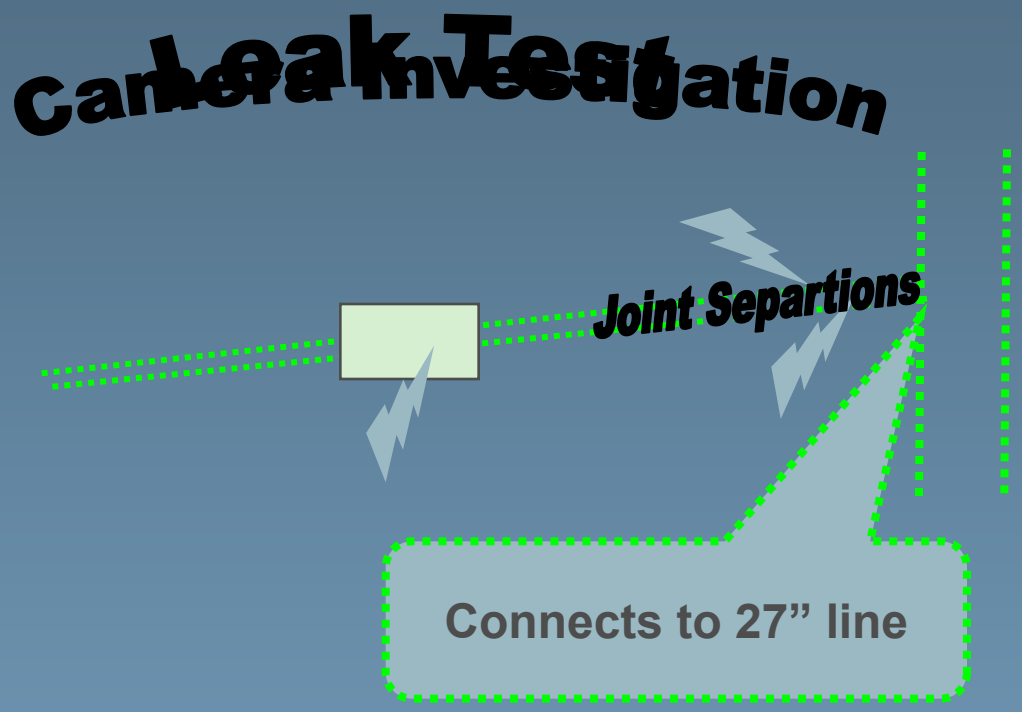
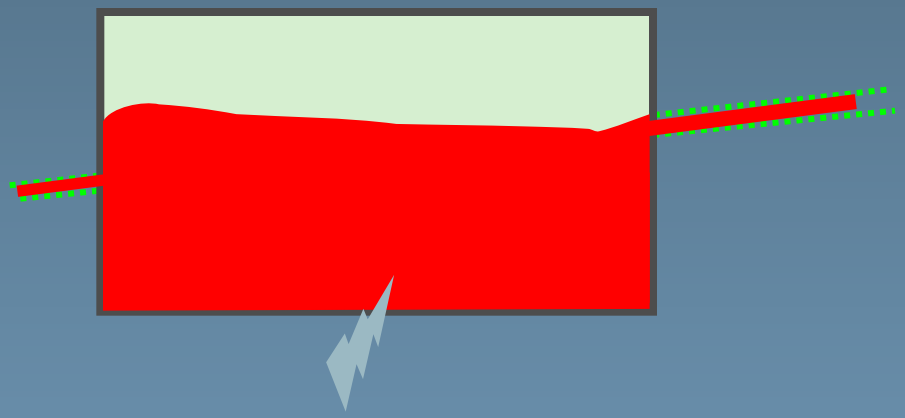


Investigation at Blount Boats

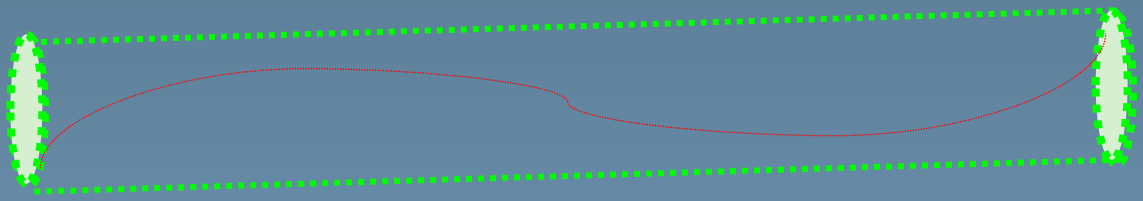
Leak Test



8 hours later = 6-inch loss

24” Line Dye-Test Results

~1100 feet



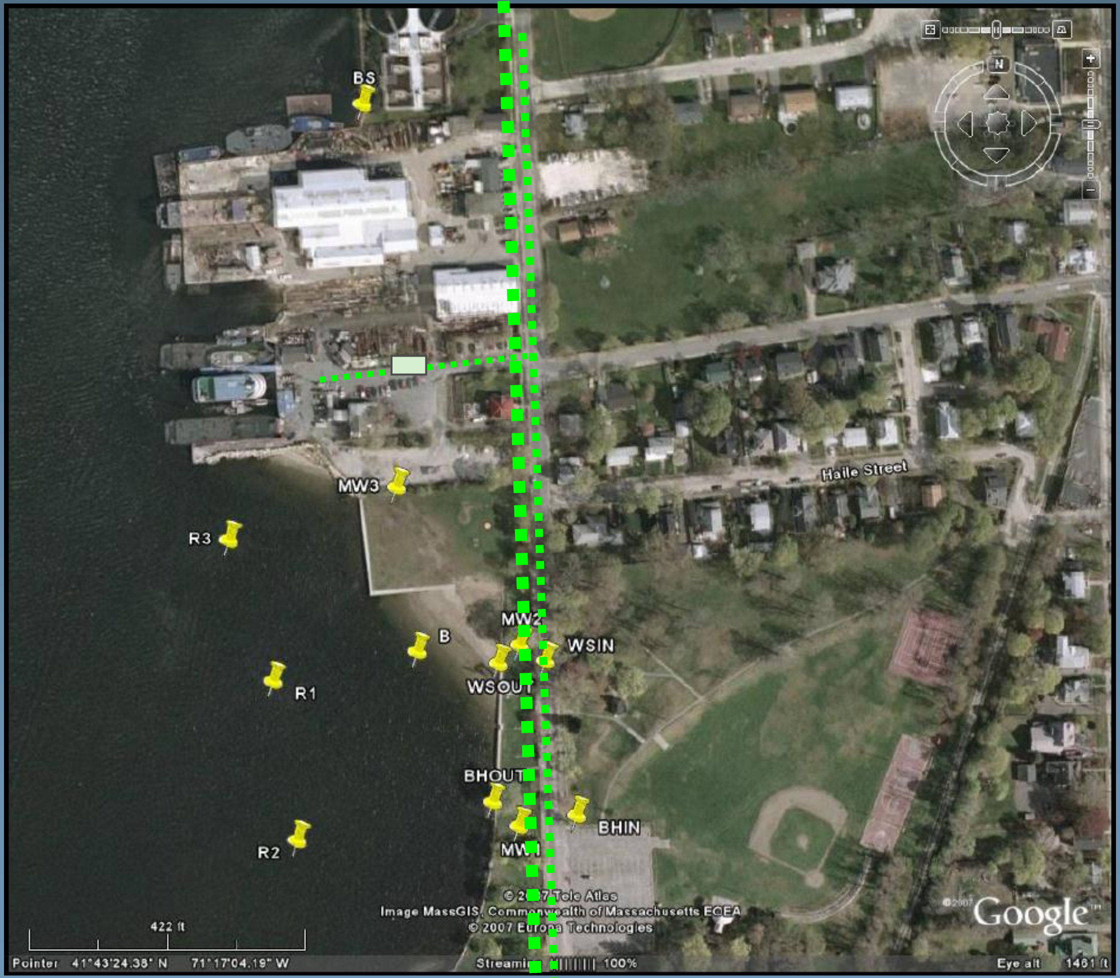
24” Line Dye-Test Observations

- Supported by TV investigation that shows infiltration into the 24-inch line.

Conclusions & Recommended Next Steps

This Leaves the Town Sewer Line

Bristol Will Need to Fix Their Line



Alternatives Available for Analysis

- Fully line 12-inch, 24-inch, 27-inch lines.
- Redo lining, but attempt to reuse existing lining.
- Replace sewers.
- Line as a temporary measure, then replace sewers.

Alternative	Approximate Schedule to Open Beach	Low-End Cost	High-End Cost	Long-Term Reliability
Fully Line Sewers	June - July	$500,000	$700,000	L - M
Reuse Existing Lining	June - July	$400,000	$600,000	Low
Replace Sewers	1 - 2 years	$1,700,000	$2,200,000	High
Line Sewers, Then Replace	June - July	$2,100,000	$2,900,000	High

Next Steps

If Lining

- Determine if partial lining is viable
  - *TV inspection of sewer lines and preliminary design*
    - *TV (~$10K); Preliminary design (~$8K)*
  - *Design and inspection are necessary whether or not the Town fully or partially lines*
  - *Appropriate funding…the Town should assume the high-end cost (i.e., $800,000)*
- Select an alternative and install lining

If Replacing Sewer Only

- Appropriate funds for preliminary design
- Seek SRF funding & consider other funding sources